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December 5, 2005

Michael E. Marshall
Secretary of the Senate
State Capitol Building
Des Moines IA 50319

Margaret A. Thomson
Chief Clerk of the House
State Capitol Building
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Dennis C. Prouty, Director
Legislative Services Agency
State Capitol Building
Des Moines IA 50319

Re: Report on Studies Relating to Cost-Effective Methods of Recognizing the Efforts of Faculty to Achieve Commercialization

Dear Members of the Iowa General Assembly:

Pursuant to House File 868, enclosed is a report of Board of Regents' studies relating to cost-effective methods of recognizing the efforts of faculty to achieve commercialization. If there are any questions concerning these reports, please do not hesitate to contact us.

Sincerely,

Gary Steinke

Enclosures

cc: Legislative Liaisons
Mary Shipman
Legislative Log

Report of Studies Relating to Cost Effective Methods of
Recognizing the Efforts of Faculty to Achieve
Commercialization
December, 2005

Board of Regents, State of Iowa

INTRODUCTION

Consistent with House File 868, the Board of Regents, State of Iowa conducted studies in 2005 relating to cost-effective methods of recognizing the efforts of faculty to achieve commercialization. These studies were based on reports from the Regent universities received by the Board of Regents in August, 2005. The studies, reported here, provide information related to the following specific issues:

1. Universities' Patent And Intellectual Property Policies
 - Institutional Philosophy On Patents And Related Intellectual Property Policy
 - Policies For Encouraging Patent Protection And University Intellectual Property
 - Financial Incentives For University Inventors
 - Licensing Intellectual Property And Taking Equity In Start-Ups
 - Promoting Technologies For Economic Development In Iowa
 - Research Partnerships With Industry
2. University Methods To Promote The Commercialization Of Intellectual Property
3. Institutional Incentives For Faculty Commercialization Of Intellectual Property
4. Important Barriers to Commercialization Of Intellectual Property
5. Regent Universities' Significant Commercialization Projects of 2004-2005
6. The Effectiveness of Partnerships for Economic Development among the Universities and Iowa Companies
7. Effectiveness of Links among Commercialization, Entrepreneurship, and Research
8. Staffing Resources for Commercializing and Promoting Innovations

1. UNIVERSITIES' PATENT AND INTELLECTUAL PROPERTY POLICIES

The management and transfer of intellectual property are components of the universities' much larger overall contribution to state economic development. Additionally, differences in the Regent universities' relative emphasis on the generation of intellectual property and its transfer to the marketplace reflect the diversity of their respective missions.

Institutional Philosophy On Patents And Related Intellectual Property

The Regent universities' stated philosophies on patents and related intellectual property express the following commitments:

- commitment to the generation of intellectual property; e.g., through incentives, investment, and faculty recruitment and retention;
- commitment to technology transfer;
- commitment to creating licensing opportunities with Iowa companies when possible;
- commitment to the management of IP for maximum public benefit, particularly, when possible, in the state of Iowa;
- adherence to overarching legal, regulatory, and ethical obligations.

Policies For Encouraging Patent Protection And University Intellectual Property

The Regent universities focus on encouraging faculty disclosure of potential innovations; i.e., through networking and communicating with faculty.

- SUI's and ISU's patent policies require faculty and employees to disclose their inventions when university resources have been utilized. In any event, all inventions resulting from federally funded projects, as well as many industrial contracts, must be disclosed.
- SUI reported that the University of Iowa Research Foundation usually seeks ownership rights of inventions disclosed to it, and thereby acquires the obligation to apply for patents and seek licensing opportunities.
- ISU reported that the ISU Office of Intellectual Property and Technology Transfer has developed a specific program of formal presentations and personal contacts to encourage faculty and staff to disclose inventions.

Financial Incentives For University Inventors

The universities' reports on financial incentives for university inventors focus primarily on the share to faculty of net earnings from intellectual property. Each university reports that these incentives are advantageous to the inventor and intended to encourage faculty innovation. Specifics vary by institution as follows:

- SUI – Inventors receive the first \$100,000 of net earnings, and 25% of earnings over \$100,000.
- ISU – Inventors receive 30% of net earnings.
- UNI – Inventors receive the first \$10,000 of net earnings, and 50% of earnings over \$10,000.

At all three universities, significant shares of earnings are also distributed to the inventor's department or college.

ISU reported that other forms of research support to inventors provide incentives to develop intellectual property. In addition, faculty at ISU and UNI can receive assistance associated with the development of start-up companies, as well as share in income resulting from equity in start-up companies.

Policies On Licensing Intellectual Property And Taking Equity In Start-Ups

The practice by universities nationally of taking equity in start-ups has generated some public attention. The Regent universities reflect some differences in approach as regards this issue.

- The University of Iowa reported that its policies are consistent with those of most large public universities in the U.S. The university does not take equity in start-ups so as to avoid inherent conflicts of interest associated with stock ownership. The university's report states that this view should not be equated with unwillingness to license new companies since a university choosing not to accept equity may nevertheless license start-ups.
- The ISU Research Foundation (ISURF) policy permits it to take equity in start-ups licensing ISU technologies as an alternative to license fees in order to reduce the impact of royalty payments to ISURF on young start-up companies.
- UNI has no formal policy on this matter but considers, and sometimes takes, equity positions in order to enhance the probability of success for a new venture.

Promoting Technologies For Economic Development In Iowa

The universities promote technologies for transfer to commercial applications essentially by networking with the business community through various venues, with a priority focus on Iowa companies.

Research Partnerships With Industry

The universities reported a variety of research partnerships with industry. Principles related to negotiating with companies are similar for all companies—whether located in Iowa or not—because of the federal tax code and the federal regulatory environment. According to current patent law, ownership follows inventorship. Joint ownership applies for jointly-developed technology. Corporate research sponsors typically receive exclusive options licenses on any patents legally owned by the institution arising from research.

2. UNIVERSITY METHODS TO PROMOTE THE COMMERCIALIZATION OF INTELLECTUAL PROPERTY

The University of Iowa

The University of Iowa promotes commercialization through the following means:

- John Pappajohn Entrepreneurial Center (JPEC) provides consulting services and training for faculty, staff, and students on technology commercialization and start-up opportunities, business planning, and raising capital.
- Staff members at the UI Research Foundation (UIRF) promote the licensing of IP through the web and directly with pharmaceutical companies and other prospects.
- The university's Entrepreneurial Ventures Interest Group offers regular presentations to introduce faculty to commercialization processes and business planning.
- Business incubation facilities (TIC, BioTIC, BELL) are available.

Iowa State University

Commercialization of intellectual property (IP) is a major objective of ISU's System for Innovation. Its functions include business and technical assistance to industry and communities in all areas of economic development. ISU constantly evaluates potential markets for its IP; encourages disclosures; funds projects with IP potential; files for patents; promotes IP through targeted marketing briefs, websites, e-mails, participation in conferences, trade shows, and investment forums; and negotiates licenses through ISURF (the Iowa State University Research Foundation). ISURF recently hired a new SBIR (Small Business Innovation in Research)/STTR (Small Business Technology Transfer Program) coordinator to facilitate industry/university grants. In addition, the institution assists in the creation of business plans and helps develop connections with investors, attorneys and accountants. Its technology incubators provide a first home for new companies. The Research Park provides space and a technology community that encourages commercialization of ISU research, and it has an outstanding success rate with start-up companies.

The University of Northern Iowa

UNI promotes commercialization in two significant ways:

- 1) UNI has adopted a "team" approach of seeking and applying the expertise of individuals in several offices and divisions to discover and then ascertain the technical feasibility of new IP disclosures. The new Intellectual Property Officer (IPO) works with researchers to "mine" new IP, organizes technical and marketing assessment teams comprised of Business & Community Services (BCS) staff, and where appropriate, initiates and manages the process of securing protection for the new IP.
- 2) UNI Encourages collaborative research—intramural and multi-disciplinary, and also with business partners. This approach, encouraged and facilitated by the Intellectual Property Officer and the Director of BCS, will draw upon the considerable outreach experience of BCS staff and bring a significant level of practicality to applied research efforts.

3. INSTITUTIONAL INCENTIVES FOR FACULTY COMMERCIALIZATION OF INTELLECTUAL PROPERTY

The University of Iowa

After patent expenses are paid, the first \$100,000 of licensing income is distributed to the inventor; after the first \$100,000 distributed to the inventor, any further licensing income is distributed as follows: 25% to inventor, 25% to UIRF, 20% to an institutional research enrichment fund, 15% to the inventor's department, and 15% to the inventor's college. When appropriate to the discipline, patent citations may be recognized in promotion and tenure portfolios.

Iowa State University

Institutional incentives to faculty include sharing of one third of the royalty income, adequate consulting time for collaboration with companies, a Leave Without Pay policy that allows faculty to devote substantial time to their start-up companies, funding for inventors to further develop their technologies, funding for faculty start-ups to pay for consultations with IP attorneys and rent in the Plant Sciences Institute (PSI) incubator.

The University of Northern Iowa

UNI's intellectual property policy is highly advantageous to the inventor. After all external costs for prototyping, evaluation, patent, etc., have been recovered, the inventor receives the first \$10,000 in royalties, licensing fees, or other income. Fifty percent of all subsequent earnings is paid to the inventor, with the remaining fifty percent divided between the UNIRF and the University Sponsoring Unit.

4. IMPORTANT BARRIERS TO COMMERCIALIZATION OF INTELLECTUAL PROPERTY

The University of Iowa

Internal barriers include further development of an entrepreneurial culture; staff to aid in earlier identification of IP, analysis of market potential, and business planning; seed funding for very early stage prototyping or proof of concept; space for business incubation, especially wet labs. External barriers include availability of management expertise, access to very early stage seed capital; access to marketing expertise.

Iowa State University

Early stage technologies require significant cash for additional research and development, proof of concept, and commercial scale-up from the university laboratory. Because most technologies are unproven outside of the university lab and many will not meet commercialization milestones, they are considered high risk by early stage investors, particularly in the Midwest. In addition, most angel and venture capital equity investors outside the Midwest strongly prefer to invest in companies within their geographic proximity. Start-up companies lack the management, resources and expertise necessary to 1) understand all issues related to intellectual property and how it impacts their companies, 2) demonstrate to potential investors that an early stage technology has commercial potential, and 3) properly conduct a thorough review and assessment of the marketability of the technology, including information on how the existence of the technology will fit into any given market and to identify serious market barriers the technology might encounter.

The University of Northern Iowa

UNI researchers who wish to develop new IP in a timely way lack sufficient financial resources and support infrastructure—release time from classroom duties, research assistants and technicians, equipment and upgraded laboratory facilities, and clerical and administrative services. A second barrier, which is now beginning to be addressed, has been the lack of an intellectual property development infrastructure and an inconsistent, sometimes desultory, IP discovery and technology transfer mechanism. Finally, there is a need for reciprocal capacity by Iowa businesses to effectively and profitably produce and market new university-developed IP.

5. REGENT UNIVERSITIES' SIGNIFICANT COMMERCIALIZATION PROJECTS OF 2004-2005

The University of Iowa

The University of Iowa's most significant commercialization projects of 2004-2005 include the following:

- ASL Analytical: noninvasive blood glucose sensing for diabetes patients; based on research conducted by Professor Mark Arnold and others.
- Vida Technologies LLC: lung image analysis software for diagnosis and treatment planning; based on research of four UI faculty (Hoffman, Sonka, Reinhardt, McLennan).
- Cellular Engineering Technologies, Inc.: tools to evaluate complex physiological responses in living cells and tissues. The company, based on work of Professor Alan Moy, has four employees. It was the first BioTIC tenant.
- Coley Pharmaceutical Group reached agreement with Pfizer to develop a UIRF immunotherapy technology to treat multiple cancers. The deal yielded a one time payment of \$6.5 million to the UIRF.

Iowa State University

In FY04, five new companies joined the ISU Research Park. One of these, CMnet Inc., has moved from the research and development mode to achieving its first sales. This company has successfully raised one round of equity capital, increased employment and secured its first customer. To assist cash-poor start-ups, ISURF now has approval to take equity in lieu of some royalty payments under its license agreements with those companies. License terms for equity with two companies have been completed but await final milestones before agreements are signed. A patented composition for lead-free solder is becoming an industry standard and has received considerable interest this last year; the impact of this interest should be realized beginning in FY06.

The University of Northern Iowa

The team at the Freeburg Center for Early Childhood Development has produced an array of new conceptual learning tools that are generating nationwide interest.

Researchers at the Metal Casting Center have begun collaborative research with industrial partners to perfect more efficient technologies including ag-based binders and air pollutant containment and reduction systems.

Environmental Lubricants Manufacturing (ELM) continues to grow, approaching nationwide market dominance in rail-curve greases, bio-based cutting fluids, and other industrial applications of bio-based lubricants.

6. THE EFFECTIVENESS OF PARTNERSHIPS FOR ECONOMIC DEVELOPMENT AMONG THE UNIVERSITIES AND IOWA COMPANIES

The University of Iowa

The Biosciences Alliance of Iowa represents an excellent existing partnership. The University of Iowa works directly with many area economic development groups and IDED to support company enhancements, recruitments, and retentions. The UI Office of Corporate Partnerships engages Iowa companies and assists them in gaining access to University of Iowa faculty, resources, and opportunities. JPEC works with other JPECs, Small Business Development Centers (SBDCs), and accelerators on entrepreneurial programming.

Iowa State University

In FY04, ISU had more than 5,200 interactions in the area of economic development with Iowa industry, communities, and economic development personnel, reaching all counties in the state. ISU's System for Innovation interfaces with most major companies, industry associations,

commodity groups, and economic development groups in the state, including the Biosciences Alliance. More than one third of licenses for technologies developed at ISU are with Iowa companies, and 47 start-ups have been formed through licensing of ISURF intellectual property since 1995, and 35 of these were Iowa-based. The ISU Research Park (ISURP) and the Pappajohn Center work routinely with the private sector investment community to create connections between new companies and prospective investors. The university provides a wide range of benefits to the companies at the Research Park, including opportunities for large companies such as Stine Seed, BASF, Unigraphics and Boehringer Ingelheim.

The University of Northern Iowa

UNI has formed partnerships with Iowa companies and communities in all 99 counties. Currently, UNI has more than 4,000 business and community clients, actively engaging approximately 1,500 of these clients each year. UNI concentrates in:

- problem solving- technical issues, market research, waste reduction, materials testing, metal castings, professional development and energy efficiency.
- strategic planning – strategic direction, business planning, collaborations, enhancing competitiveness.
- advanced workforce training – technical training, meeting the needs of new workers in Iowa (immigrants and refugees) and educating the future workforce, student interns and experiential learning.

7. EFFECTIVENESS OF LINKS AMONG COMMERCIALIZATION, ENTREPRENEURSHIP, AND RESEARCH

The University of Iowa

Early stage entrepreneurship meshes well with applied research activities. National Institutes of Health (NIH) interest in translational research meshes well with entrepreneurship and commercialization. But, there are some issues that must be carefully managed: conflicts of interest and commitment, conflicts in uses of institutional space and resources, guarding against turning excellent researchers into poor CEOs.

Iowa State University

ISU's Economic Development Council (EDC, formerly CCOTT) coordinates the research, commercialization, and entrepreneurship activities of the colleges, the central research centers and institutes, and the technology transfer and economic development units associated with ISU. Working groups within EDC concentrate on specific aspects of the ISU's economic development mission and report to EDC on a monthly basis.

The University of Northern Iowa

UNI has been preparing to establish a small but permanent infrastructure, and a more responsive, efficient process to promote and support IP development and technology transfer. On July 1, UNI expects to appoint its first full-time Intellectual Property Officer. This individual will "mine" new IP; guide the work of the Intellectual Property Committee; promote collaboration between university researchers and external partners; and facilitate coordinated work of several university entities, including the division of Business and Community Services, Office of Research and Sponsored Programs, and the UNI Research Foundation.

8. STAFFING RESOURCES FOR COMMERCIALIZING AND PROMOTING INNOVATIONS

The University of Iowa

JPEC has the professional ability but very limited time to support these activities. UIRF staff members have expertise in promoting licensing opportunities

Iowa State University

Currently, ISU has 73 professional and scientific staff in appropriate administrative units whose principal responsibilities are technology transfer and economic development. These include positions in ISURF/Office of Intellectual Property and Technology Transfer, ISURP, the Vice Provost for Research Office, the Pappajohn Center, PSI, the College of Engineering, the Biorenewables Program, the Center for Industrial Research and Service, the Institute for Physical Research & Technology and the Iowa Manufacturing Extension Partnership.

The University of Northern Iowa

UNI possesses significant expertise for commercializing and promoting. Notable are employees of Strategic Marketing Services, Institute for Decision Making, Iowa Waste Reduction Center, John Pappajohn Entrepreneurial Center, Regional Business Center, Metal Casting Center, and Ag-Based Industrial Lubricants Center.